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Genetic specificities of the acetylation system in patients with erysipelas

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Abstract

© 2018, Dynasty Publishing House. All rights reserved. The objective. To study a contribution of polymorphic variants of the N-acetyltransferase 2 detoxification system gene to the formation of predisposition to erysipelas infection and to establish associative relationships with the clinical course of disease. Patients and methods. The observation included 92 patients with erysipelas (basic group) aged 22 to 88 years (63.38 ± 11.85), of them 72.8% were women. The control group consisted of conditionally healthy individuals (n = 71), who did not have a history of the disease under study and were comparable with the basic group by gender (70.4% of women, 29.6% of men, p > 0.05) and age (58.34 ± 6.93 years; p > 0.05). The material for molecular-genetic examinations was peripheral blood. Genotyping was performed by the method of polymerase chain reaction. Results. Distribution of the NAT2 gene polymorphisms in the group of patients with erysipelas (n = 92) and in the control group of healthy individuals (n = 71) has shown the presence of the G/A NAT2 Gly286Glu genotype associations with the development of erysipelas. We have found associative relationships between the C/T NAT2 Leu161Leu and C/C NAT2 Leu161Leu genotypes and the character of local process. A risk for development of erysipelas in women is associated with the C/C NAT2 Leu161Leu genotype, in men with G/A NAT2 Gly286Glu. Conclusion. Polymorphisms in the NAT2 gene influence the predisposition to the development of erysipelas and specificities of the clinical course of disease.

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Keywords

Detoxification, Erysipelas, Genetic polymorphism, N-acetyltransferase

References

[1] Briko NI, Glushkova EV, Nosik AG, Dmitriev AV, Dmitrieva NF, Kleimenov DA, Lipatov KV. Frequency of diseases caused by group a Streptococci among invasive infections of soft tissues and characteristics of the causative agent. Journal of Microbiology, Epidemiology and Immunobiology. 2014;5:24-31. (In Russian).

[2] Erovichenkov AA, Briko NI, Malyshev NA, Potekaeva SA, Kovaleva EV, Kardonova EV, Lipatov KV, et al. A clinical-epidemiological characteristic of erysipelas in Moscow in the past years. Infekc. bolezni (Infectious diseases). 2015;13(1):46-52. (In Russian).

[3] Ratnikova LI, Ship SA, Bespalova MK, Garifanova AR. Erysipelas as variant of noninvasive streptococcal infections, skin disease comorbidity. Infektsionnye zabolevaniya. 2016;6(28). (In Russian).

[4] Kravchenko IE, Garmonov SYu, Shitova NS, Aibatova GI. Biofarmatsevticheskii analiz protsessov atsetilirovaniya u bol'nykh rozhei. Vestnik Kazanskogo tekhnologicheskogo universiteta. 2013;21:209-11. (In Russian).

[5] Baranov VS, Baranova EV, Ivashchenko TE, Aseev MV. Genom cheloveka i geny “predraspolozhennosti”. St.Petersburg: “Intermedika” Publ., 2000, pp. 76-85. ISBN: 5-89720-030-0. (In Russian).

[6] Bartholomeeusen S, Vandenbroucke J, Truyers C, Buntinx F. Epidemiology and comorbidity of erysipelas in primary care. Dermatology. 2007;215(2):118-22. DOI: 10.1159/000104262.

[7] Pereira de Godoy JM, Galacini Massari P, Yoshino Rosinha M, Marinelli Brandão R, Foroni Casas AL. Epidemiological data and comorbidities of 428 patients hospitalized with erysipelas. Angiology. 2010 Jul;61(5):492-4. DOI: 10.1177/0003319709351257.

[8] Kravchenko IE, Briko NI, Fazylov VKh. Treatment personalization for patients with streptococcal quinsy on the basis of determination of the activity of metabolic enzyme systems. Epidemiology and Infectious Diseases. 2011;4:4-7. (In Russian).

[9] Emene CP, Kravchenko IE, Aibatova GI, Rizvanov AA. Polymorphism of genes of the antioxidant system in patients with erysipelas and their role in development of the disease. Genes and Cells. 2015;10(4):118-22.

[10] Zagidullina AI. Patogeneticheskoe znachenie protsessov perekisnogo okisleniya lipidov, antioksidantnoi zashchity i sistemy gemostaza, korrektsiya ikh narushenii metodom ozonoterapii pri rozheDiss.: 14.00.10. St.Petersburg, 2005. (In Russian).

[11] Zagidullina AI, Fazylov VKh. Vliyanie sistemnoi ozonoterapii na lokal’nyi otek pri rozhe nizhnikh konechnostei. Practical Medicine. 2006;4(18):37-40. (In Russian).

[12] Zhestovskaya AS, Kukes VG, Sychev DA. Personalizirovannaya meditsina: mif ili real’nost’? Pozitsiya rossiiskikh klinicheskikh farmakologov. EPMA J. 2013;4(1):13. (In Russian).

[13] Kukes V.G. Metabolizm lekarstvennykh sredstv. Nauchnye osnovy personalizirovannoi meditsiny. Grachev SV, Sychev DA, Ramenskaya GV. Moscow: “GEOTARMedia” Publ., 2008; 304 p. (In Russian).

[14] Nekhoroshkina MO, Bushueva OYu, Polonikov AV, Darpinyan MM, Golubtsov VI. Association of polymorphism G590A of the NAT2 gene with congenital cleft lipand palate in Krasnodar region. Kursk Scientific and Practical Bulletin «Man and His Health». 2013;4:33-37. (In Russian).

[15] Rothman N, Garcia-Closas M, Hein DW. Commentaryreflections on G. M. Lower and colleagues’ 1979 study associating slow acetylator phenotype with urinary bladder cancer:meta-analysis, historical refinements of the hypothesis, and lessons learned. Int J Epidemiol. 2007;36(1):23-8:23-8. DOI: 10.1093/ije/dym026.

[16] Hein DW, Doll MA, Fretland AJ, Webb SJ, Xiao GH, Devanaboyina US, et al. Molecular genetics and epidemiology of the NAT1 and NAT2 acetylation polymorphisms. Cancer Epidemiol Biomarkers Prev. 2000;9:29-42.

[17] Genova OA, Morozova OI, Lebedko OA, Kozlov VK. Peculiarities of oxidative status and polymorphism in genes of xenobiotics detoxication enzymes in adolescents with non-differentiated connective tissue dysplasia. Far East Medical Journal. 2010;3:114-6. 2010;3:114-6. (In Russian).

[18] Walraven JM, Zang Y, Trent JO, Hein DW. Structure/function evaluations of single nucleotide polymorphisms in human N-acetyltransferase 2. Curr Drug Metab. 2008;9:471-86.

[19] Gra OA, Glotov AS, Nikitin EA, Glotov OS, Kuznetsova VE, Chudinov AV, et al. Polymorphisms in xenobiotic-metabolizing genes and the risk of chronic lymphocytic leukemia and non-Hodgkin’s lymphoma in adult Russian patients. Am J Hematol. 2008 Apr;83(4):279-87. DOI: 10.1002/ajh.21113.

[20] Raunio H, Husgafvel-Pursiainen K, Anttila S, Hietanen E, Hirvonen A, Pelkonen O. Diagnosis of polymorphisms in carcinogen-activating and inactivating enzymes and cancer susceptibility. Gene. 1995;159(1):113-21.

[21] Borlak J, Reamon-Buettner SM. N-acetyltransferase 2 (NAT2) gene polymorphisms in Parkinson’s disease. BMC Medical Genetics. 2006;7:30-39. DOI: 10.1186/1471-2350-7-30.

[22] Schwartz JB. The influence of sex on pharmacokinetics. Clin Pharmacokinet. 2003;42(2):107-21. DOI: 10.2165/00003088-200342020-00001.

[23] Bertz RJ, Granneman GR. Use of in vitro and in vivo data to estimate the likelihod of metabolic pharmacokinetic interactions. Clin Pharmacokinet. 1997;32:210-58.

[24] Franconi F, Campesi I. Pharmacogenomics, pharmacokinetics and pharmacodynamics: interact-tionwith biological differences between men and women. Br J Pharmacol. 2014 Feb;171(3):580-94. DOI: 10.1111/bph.12362.

[25] Soldin OP, Chung SH, Mattison DR. Sex differences in drug disposition. J Biomed Biotechnol. 2011;2011:187103. DOI: 10.1155/2011/187103.